CLAIMS

1.- Handset for radio communication, comprising an antenna and a ground-plane associated with the antenna, the antenna being situated in correspondence with an antenna end of the ground-plane, **characterised** in that it further comprises at least one conducting surface situated over a part of the ground-plane and separated from said part of the ground-plane, said at least one conducting surface being arranged so that said part of the ground-plane and said at least one conducting surface, in combination, establish a resonance circuit having a high impedance at an operating frequency of the antenna, towards the antenna end of the ground plane.

2.-Handset according to claim 1, wherein said at least one conducting surface is short-circuited to the ground-plane at a position situated at a distance from an end of the conducting surface facing the antenna end of the ground-plane, said distance being such that it corresponds to an electric path length of substantially one quarter of the wavelength at the operating frequency, or an odd multiple of a quarter of said wave length.

3.- Handset according to claim 1, wherein said at least one conducting surface is not short-circuited to the ground-plane, said at least one conducting surface being arranged such that said resonance circuit has a first open end facing the antenna end of the ground-plane and a second open end separated from said first open end by a distance corresponding to an electrical path length substantially equal to half of the wavelength or a multiple of said half of the wavelength, at the operating frequency.

4.- Handset according to claim 1 or 2 wherein the ground plane defines an outer perimeter and wherein said at least one conducting surface is short-circuited to the perimeter of the ground plane or to an inner part of the ground plane.

5.- Handset according to any of the preceding claims wherein it comprises at least one conducting surface over each side of said ground plane.

6.- Handset according to any of the preceding claims wherein said at least one conducting surface is defined by a conducting plate or by a layer of conducting material selected from the group comprising: conducting paint, conducting ink or conducting paste.

7.- Handset according to any of the preceding claims wherein at least one edge of one conducting surface and at least one edge of the ground plane, are lying on a plane which is substantially perpendicular to the ground plane.

8.- Handset according to any of the preceding claims wherein at least one part of said at least one conducting surface is substantially parallel to the ground plane.

9.- Handset according to any of the preceding claims wherein the ground plane comprises a first conducting part and a second conducting part, said first and second conducting parts being electrically connected by at least a conducting strip, said strip being narrower than the width of any of said first and second conducting parts.

10.- Handset according to claim 9 wherein the first and the second part of the ground plane are substantially rectangular.

11.- Handset according to any of the preceding claims wherein said at least one conducting surface is substantially rectangular.

12.- Handset according to claim 10 or 11 wherein said at least one conducting surface has the same width as the first or the second part of the ground plane.

13.- Handset according to claim 10 or 11 wherein said at least one conducting surface is narrower than the ground plane.

14.- Handset according to any of the claims 11 to 13 wherein said at least one conducting surface is aligned with said conducting strip.

15.- Handset according to any of the claims 9 to 14 wherein said at least one conducting surface comprises a first end short-circuited to the ground plane, and a second end which is an open circuit and it is facing said conducting strip.

16.- Handset according to any of the preceding claims wherein comprises an array of two or more conducting surfaces narrower than the ground plane, said conducting surfaces arranged parallel or perpendicular with respect to a ground plane longitudinal axis.

17.- Handset according to claim 16 wherein the conducting surfaces have different length and/or different width.

18.- Handset according to claim 16 or 17 wherein the array of conducting surfaces is a periodic structure.

19.- Handset according to any of the claims 1,2, 4 to 18 wherein said at least one conducting surface is U-shaped having two side arms wherein each side arm features an electrical length of substantially a quarter wavelength at the operating frequency, and wherein said side arms are short-circuited at their ends to the ground plane, and wherein said at least

one conducting surface comprises an extension which is facing said conducting strip.

20.- Handset according to any of the claims 1,3, 4 to 18 wherein said at least one conducting surface comprises two side arms having each arm an end in open circuit, and wherein each arms features an electrical length of substantially half of wavelength at the operating frequency, and wherein said at least one conducting surface comprises an extension which is facing said conducting strip.

21.- Handset according to any of the preceding claims wherein the conducting surfaces and/or the ground plane are a conducting layer of a multilayer printed circuit board, and wherein the ground plane layer is located in between said conducting surfaces.

22.- Handset according to claim 21 wherein said at least one conducting surface is short-circuited to the ground plane by means of a metallized via hole in the printed circuit board.

23.- Handset according to any of the claims 5 to 22 wherein at least one conducting surface over one side of the ground plane, is a mirror image of another conducting surface placed over the other side of the ground plane.

24.- Handset according to any of the claims 6 to 23 wherein the handset comprises a cover made of non-conducting material and wherein said conducting paint, paste or ink is coated on a face of said cover.

25.- Handset according to any of the claims 2, 4 to 20, 21 to 24 wherein said at least one conducting surface is short-circuited to the ground plane by means of shorting means selected from the group comprising: a metallic

connection, a capacitive component having low impedance at RF frequencies, conductive paint, conductive paste or conductive ink

26.- Handset according to any of the preceding claims wherein it is a clamshell or flip-phone handset.

27.- Handset according to any of the preceding claims wherein a part of at least one conducting surface and/or a part of the ground plane is a multilevel structure or a space-filling curve.

28.- A clamshell handset including an electromagnetic bra structure at least at one half of the handset phone, such an electromagnetic bra structure comprising two conducting plates, said plates being placed at both sides of a ground plane of such a handset, both of said plates being connected at least at one point of the handset, said plates being a quarter wave in length or an odd multiple of a quarter wavelength, with the opening nearby the hinge of said clamshell phone.

29.- Method of producing a handset according to any of the preceding claims characterised in that it comprises arranging at least one conducting surface over a part of the ground-plane and separated from said part of the ground-plane, so that said part of the ground-plane and said at least one conducting surface, in combination, establish a resonance circuit having a high impedance at an operating frequency of the antenna, towards the antenna end of the ground plane.